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ABSTRACT

Directors of the 51 agricultural experiment stations in the United States (including Guam) were mailed questionnaires inquiring as to the extent of requests which had been received for information about wind, solar, and other energy alternatives such as wood and gasahol. There was a total response of 88% with three mailings. The returned questionnaires show considerable interest and desire to apply the sun, gasahol, and wood as alternative sources of energy. Accompanying this paper is a listing of experiment station materials giving information on the various energy alternatives. (Author)

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tate agricultural experiment stations".
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Several works have considerable relevance to this study. Barry Commoner in The Politics of Energy emphasized the need to place much more emphasis on solar energy, as opposed to the President's stressing nuclear energy and coal as the most appropriate alternatives to oil imports. Commoner holds that the solar voltaic cell, used in watches and calculators, could be rapidly developed as a cheap and readily available energy alternative. Stobaugh and Yergin in Energy Future: the report of the Harvard Business School Energy Project, make a carefully researched case for a combination of conservation and energy alternatives. These authors estimate that effective conservation measures would enable our economy to operate at the same level it does presently, with 40% less energy. Energy Future at the same time sees the contribution to energy efficiency of such alternatives to oil and gas as wood, waste, solar and wind.

With the above approaches in mind, it was decided to inquire of the 51 agricultural experiment stations in the United States as to what types of requests had been made for information on energy alternatives. The questionnaire which was constructed was structured around the alternatives of wind, solar and miscellaneous (gasahol, methanol, wood and

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alcohol). The items or alternatives selected for inclusion were chosen because of their prominence in the news media during the several months prior to the mailing of the instrument. The agricultural experiment stations were selected as a population because they were considered the most likely to receive requests for such information, having on hand pamphlets available free or at low cost. The stations are tied in in each state to the cooperative extension service, which has available at its offices and makes available through workshops and seminars, information dealing with energy conservation and alternatives. The questionnaires were mailed out in the fall of 1979. There was a total return rate of 88% as a result of three mailings. The returned questionnaires, as the summaries following this introduction demonstrate, show evidence of considerable interest in and desire to apply especially energy alternatives of wood, gasahol, and solar energy. Enclosed as appendices to this paper are several appendices: 1) the questionnaire used, 2) a list of pamphlets and brochures offering information on various energy alternatives.

## A. Wind Generation

To what extent have you received requests for information on the subject of wind generation?
(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 4% | 63% | 20% | 13% | 100% |

Only two stations (4%) received many requests, but nearly two thirds (28) received at least some requests. One in five stations received no requests. Less than one fifth (6) did not answer.

If you have had requests for such information, what type of information was asked for?
(N= 29)

| plans or designs | feasibility | equipment | total |
|---|---|---|---|
| 47% | 28% | 25% | 100% |

Nearly half (14) of stations responding received requests for plans or designs. Requests for information about feasibility (8) and equipment (7) were about equal.

## B. Solar Energy

To what extent have you received requests for information on the subject of solar energy?
(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 46% | 36% | 2% | 16% | 100% |

Nearly half of the stations responding (21) had many requests for information on solar energy. Nearly 40% (16) received some requests. Hardly any received none. Less than 20% (7) did not respond.

To what extent have you had requests about the use of solar energy for grain drying?

(N-45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 7% | 44% | 33% | 16% | 100% |

Over 40% (20) had some requests, while one third (15) of the stations had no requests. Nearly 20% (7) did not answer. Less than 10% had many requests for grain drying information.

To what extent have you had requests about the use of solar energy for heating and cooling of farm buildings such as dairy barns and hog houses?

(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 13% | 56% | 13% | 18% | 100% |

Nearly 70% had at least some requests for solar heating and cooling information. Over four times as many requests (25 cf. 6) however, said they had some rather than many inquiries. Slightly over 10% (6) received no requests- nearly as many (8) as those not responding to this question.

To what extent have you had requests about the use of solar energy for heating and cooling of residences and houses?

(N-45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 33% | 44% | 7% | 16% | 100% |

Nearly 80% (35) received either some or many requests for solar home heating information. Of these, about 10% more (20) reported some than many (15) such requests. Less than 10% (3) received no requests at all, while less than 20% (7) did not answer.

A summary table of solar energy inquiries

| | Solar Energy Inquiry | | | |
|---|---|---|---|---|
| | general (N=45) | grain drying (N=45 | heating & cooling farm buildings (N=45) | heating & cooling homes (N=45) |
| many requests | 46% | 7% | 13% | 33% |
| some requests | 36% | 44% | 56% | 44% |
| no requests | 2% | 33% | 13% | 7% |
| no answer | 16% | 16% | 18% | 16% |
| total | 100% | 100% | 100% | 100% |

Requests for information about residence use of solar was highest for the "many request" category- over twice as many as for farm buildings. At least some requests were made by more than half of the specific types of inquiry. Information concerning homes was over 75%, and that for farm buildings, over two thirds.

What other requests have you received about the use of solar energy?

(N=33)

| construction design | food drying | passive solar | heating | feasibility | miscellaneous |
|---|---|---|---|---|---|
| 25% | 21% | 18% | 15% | 9% | 12% |

Nearly two thirds (21) wanted information on construction design or passive solar construction. Those interested in learning about the possibilities of solar energy for food drying (7) constituted over one fifth.

## B. Fuel Alternatives

To what extent have you received requests for information on gasahol?

(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 29% | 48% | 7% | 16% | 100% |

At least some requests were received by nearly 80% (35) of the agricultural experiment stations. Nearly 30% (13) received many requests, while nearly half (22) received at least some requests. Less than 10% (7) received no requests at all. Less than 20% did not reply to this question.

To what extent have you received requests for information on alcohol?

(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 31% | 35% | 18% | 16% | 100% |

At least some requests were received by nearly two thirds (30) of the experiment stations, with slightly more than half receiving some requests. Nearly 20% (8) received no requests at all-nearly the same number (7) as those not responding.

To what extent have you received requests for information on ethanol?

(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 22% | 27% | 33% | 18% | 100% |

Nearly half (22) the stations received at least some requests for information on ethanol. One third (15) received no requests. Nearly 20% (8) did not reply.

To what extent have you received requests for information on diesahol?

(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 11% | 27% | 46% | 16% | 100% |

Nearly half (21) the respondents received no requests about information on diesahol. Nearly 40% (17) received at least some requests. Less than 20% (7) did not reply to this question.

To what extent have you received requests for information on wood?

(N=45)

| many requests | some requests | no requests | no answer | total |
|---|---|---|---|---|
| 44% | 29% | 11% | 16% | 100% |

Nearly 75% (33) received at least some requests for information on wood. Of these, over half (20) received many requests for such information. About 10% (5) received no requests. Less than one fifth (7) did not reply.

What sort of information was requested on gasahol, alcohol, ethanol, diesahol, or wood?

(N=39)

| gasahol | wood stoves (selection & installation) | alcohol (production & plans) | miscellaneou (general, pe mits, effi- ciency) |
|---|---|---|---|
| 26% | 23% | 13% | 38% |

Requests for information on gasahol (10) and woodstoves (10) made up nearly half (19) the requests. Over 10% (5) of the requests concerned details of alcohol usage, mainly stills. The remainder of requests (nearly 40%) dealt with such matters as plans, potentials and permits.

A summary table of inquiries concerning energy alternatives

To what extent have you received requests for information on energy alternatives?

| | wind (N=45) | solar (N=45) | gasahol (N=45) | alcohol (N=45) | ethanol (N=45) | diesahol (N=45) | wood (N=45) |
|---|---|---|---|---|---|---|---|
| many requests | 4% | 46% | 29% | 31% | 22% | 11% | 44% |
| some requests | 63% | 36% | 45% | 35% | 27% | 27% | 29% |
| no requests | 20% | 2% | 7% | 15% | 33% | 46% | 11% |
| no answer | 13% | 16% | 16% | 16% | 15% | 16% | 16% |
| total | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Summary of summaries

To what extent have you received requests for information on energy alternatives?

| | wind (N=45) | solar (N=45) | other (averaged) (N=45) |
|---|---|---|---|
| many requests | 4% | 46% | 27% |
| some requests | 63% | 36% | 34% |
| no requests | 20% | 2% | 23% |
| no answer | 13% | 16% | 16% |
| total | 100% | 100% | 100% |

Over 80% of agricultural experiment stations responding had at least some requests for information dealing with solar energy. Nearly two thirds had at least some requests for information on other fuel alternatives. Nearly half the stations received many requests for solar- nearly twice as many as those responding to this extent regarding other fuel alternatives, and nearly ten times as many as for wind. Evident is the very high interest in solar energy, both absolutely and relatively.

## Summary

Data concerning requests for information on energy alternatives was collected in three mailings from 45 of the 51 agricultural experiments in the United States and trust territories. Information on wind energy was requested mainly in the form of plans or designs, but also concerning both feasibility and equipment. Nearly half the respondents requested information on solar grain drying. Over two thirds requested solar energy information for the heating and cooling of farm buildings, with nearly 80% doing so for homes. Many requests for information were requested by nearly half those interested in solar and wood alternatives, with about 30% of those wanting information about gasahol and alcohol doing so. At least some requests for information were made for over 80% of those wanting to know more about solar, about 75% for gasahol and wood, and about two thirds for alcohol and wind. The tally of specific information requests on gasahol, alcohol, ethanol, diesahol and wood suggests that there was considerable interest in putting especially wood and gasahol into increased use as energy alternatives. A copy of the questionnaire and a bibliography of articles and bulletins dealing with the various energy alternatives received with the returned questionnaires is included in appendices.

## Conclusion

Solar energy was clearly the energy category receiving the most requests, with wood a close second. These two items received the most attention, with gasahol and alcohol following close behind. Solar and gasahol may have received the most publicity recently. There has been considerable attention also given to wood, particularly to the use of wood stoves. It may be that gasahol manufacture and use of available wood from scrap and lots constitute the most readily available and familiar source of energy. The types of information requested shows a strong desire of citizens to put into practice the energy alternatives of wind, sun, gasahol and wood.